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the crops on which they occur and are subdivided into diseases of major and minor importance. This arrangement is especially serviceable to those who are not specialists on plant diseases. The descriptions of the symptoms are brief, clear and very readable. There is no attempt whatever to discuss the organisms which are the causes of these diseases but references are given to some of the more important publications. Each disease is designated by its common name; the scientific name for both the imperfect and the perfect stages, where known, are placed in parenthesis. The book also contains chapters on the history of the subject, damages due to plant diseases, prevention and cure, general diseases which attack a large number of crops, fungicides and soil disinfection. The chapter on cost of spraying which was in the first edition is very properly omitted since this is a varying factor dependent on cost of materials and labor.

The work is intended primarily as a textbook and it will prove of great service to all teachers of plant pathology. Possibly its greatest value lies in the brief, clear descriptions which are of such great importance in making diagnoses of diseases in the field. The student of mycology will also find it an important supplement for his work on economic forms. The horticulturists, nurserymen, county farm demonstrators, progressive farmers and in fact all others who are interested in the applications of agriculture will find it an extremely useful reference book.

The mechanical make-up of the work is good except for the crowded arrangement of the bibliography which would lead any one who uses it to fear that the supply of paper is exhausted.

MEL T. COOK

NEW JERSEY AGRICULTURAL
EXPERIMENT STATION

SPECIAL ARTICLES

THE Y-CHROMOSOME IN MAMMALS

THE majority of workers on mammalian spermatogenesis have described the sex-chro-

mosome as being of the X-O type but recent investigations in this field by the author indicate that the X-Y type of chromosome may be more common than is generally thought.

In the opossum,¹ an animal for which the X-O type of sex-chromosome has been described, the writer finds a typical X-Y sex-chromosome complex. Both the X and Y components may be recognized in spermatogonial and somatic divisions because of their distinctive size. In the first maturation division the X and Y elements segregate apart to opposite poles of the cell, and in the second maturation division both divide equationally. Hence half of the sperm carry an X and half carry a Y chromosome.

The diploid chromosome number for both the male and female opossum is 22, and not 17 or 24 as concluded by previous investigators.

In the testes of both the white man and the negro I have found in the first spermatocytes a chromosome pair which is similar in appearance and behavior to the X-Y chromosome of the opossum. The two members of this pair, in the human, representing the X and Y components, are unequal in size; they segregate apart in the first maturation division just as in the case of the opossum.

It will be of general interest to biologists to know that the diploid number of chromosomes for man is very close to the number (47) given by Winiwarter.² In my own material the counts range from 45 to 48 apparent chromosomes, although in the clearest equatorial plates so far studied only 46 chromosomes have been found. Before a final conclusion is made on the exact number it is desired to make a careful study of a large number of division plates. There can be absolutely no question, however, but that the diploid number of chromosomes for both the white man and the negro falls between 45 and 48. With the X-Y type of sex-chromosome we

¹ The writer's work now in press.

² Winiwarter, H. von, 1912, *Arch. de Biol.*, Vol. 27.

may expect an even number, that is, either 46 or 48.

My material to date includes the testes of one white man and of two negroes. All individuals were castrated because of self abuse, at one of the Texas state institutions. The testes were removed with the use of local anæsthetics and immediately preserved in Bouin's fluid, to which chromic acid and urea had been added. In less than a minute after removal from the body the germ-cells were being bathed in the fixing fluid. The preservation thus obtained is very satisfactory.

In view of the uncertainty which has existed regarding the chromosome number in man, the author will gladly send samples of this human material to any experienced cytologist in order that the latter may verify for himself the correctness of the chromosome counts given. The complete spermatogenesis of man is being reworked by the writer at the present time and his results will be published in the near future.

THEOPHILUS S. PAINTER

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THE ROCHESTER MEETING OF THE AMERICAN CHEMICAL SOCIETY

THE sixty-first general meeting of the American Chemical Society was held at Rochester, N. Y., from April 25 to April 29, inclusive. The council meeting was held on April 25, the general meeting on the morning and afternoon of the twenty-sixth, divisional meetings all day Wednesday and Thursday, and excursions on Friday. Full details of the meeting and program will be found in the May issue of the *Journal of Industrial and Engineering Chemistry*. The registration was 1,139, and 1,270 sat down to dinner at the good fellowship meeting.

General public addresses were given by Senator James W. Wadsworth, Jr., on "Some Problems of National Defense," and by Congressman Nicholas Longworth, on "The American Chemical Industry and its Need for Encouragement and Protection." At the gen-

eral business meeting held Tuesday morning, April 26, Charles F. Chandler and William H. Nichols were unanimously elected honorary members of the society. The chief public address was given at Convention Hall on Wednesday evening, April 27, by Charles F. Chandler, on "Chemistry in the United States." At the general meeting on Tuesday afternoon, the following general papers were presented:

"Ammono carbonic acids," by E. C. Franklin.

"The measurement of color," by C. E. K. Mees.

"Blue eyes and blue feathers," by W. D. Bancroft.

"Surface Films as Plastic Solids," by R. E. Wilson.

"The relation between the stability and the structure of molecules," by Irving Langmuir.

"Ionization of electrolytes," by G. N. Lewis.

The following divisions and sections met: Divisions of Agricultural and Food Chemistry, Biological Chemistry, Chemistry of Medicinal Products, Dye Chemistry, Industrial and Engineering Chemistry, Organic Chemistry, Physical and Inorganic Chemistry, Rubber Chemistry, and Water, Sewage and Sanitation; Sections of Cellulose Chemistry, Petroleum Chemistry and Sugar Chemistry and Technology. Further details of their meetings will be found in the May issue of the *Journal of Industrial and Engineering Chemistry*.

Tuesday evening was given up to dinners and gatherings of various colleges and fraternities. On Thursday evening the good fellowship meeting, complimentary to the members of the Rochester Section, consisted of a dinner in the Bausch and Lomb dining hall, followed by a varied and interesting program consisting of music, vaudeville entertainment, motion pictures of the convention itself and prominent members thereof, and a film shown for the first time, picturing the operations of the Eastman Kodak Company. The scientific program was the most extensive ever presented before a meeting of the American Chemical Society and consisted of 280 papers.

CHARLES L. PARSONS,
Secretary